Group 5

Description

Scoop:

Our idea is providing a promising software management system for local library, which will have well-structured architecture, user-friendly GUI, and fine-tuned database. Our perspective is to build a system can execute all library related tasks, in order to diminish the physical interactions with the ordinary library. Our system will be operated and manipulated by library admin and librarian, these two users are responsible for database management and staff management. The main user is the customer who has functionalities as viewing or renting library rooms, in addition to borrowing books by only using the system, moreover, there are authors that make events and publish digital books.

Customer

* Customer can deposit money into account so he can print documents (when the customer request to print a file the system checks the account balance).
* The customer can print file by sending a printing request to the library printing system (library printing system is not the same as library management system).
* The customer can subscribe in the rooms reservation service by adding payment method and information. He can subscribe in three different plans in the room’s subscription serves, each plan allows the customer to rent different room classes (general room, deluxe room, primum room).
* The customer can request missing books and the librarian will handle this request.

Librarian

* The librarian can return rented books to the system (update the data base) after the customer return it to the librarian physically.
* The librarian can file a report against a customer to suspend the customer account or flag it for a specific reason like corrupting books (each report will add strike to the customer account, if the account has three strikes, the account will be suspended).
* He can manage the book shelfs and books details, with altering the changes in the database.

Admin

* Admin can view the reports that librarians made, and if he validated a report, the customer account will be strike, when the count strike be more than three the account will be suspended.
* Admin is responsible for accepting or declining requests from the author.
* He manages the data of each actor in the system {Customer, Librarian and Author}

Author

* Author is a unique user account that can request the library to host an event signature ceremony or to publish a digital book, the requested events and digital books are managed by admin, which means the admin must accept the request in order to be saved and scheduled.

Assumptions:

1. Our local library has rooms that can be rented for meetings, studying or conferences.
2. The customer to be able to rent room he must be a subscriber for monthly paid plan.
3. The librarian is responsible for organizing and manipulation of books.
4. The librarian should make reports for books status, customer behavior to make an action.
5. The Administrator is responsible of managing the accounts of customers and librarian.
6. There is only one admin for the system.
7. The librarian is responsible of returning or checking in the rented books to the system.

Constraints:

1. Customer can rent a book for maximum a week.
2. Customer can only rent 3 books at a time.
3. Customer can renew each book only twice.
4. Customer must be a subscriber to rent a room.
5. Admin cannot suspend unflagged accounts.

Design Patterns:

Singleton pattern-admin

The system scope is not big enough to add multiple admins and distribute the responsibilities among them. We want only one instance of an admin that can access all data and classes

Diagram

Description automatically generated with medium confidence

Read-only Pattern- Customer

We want the customer to access book class getters only so he can view a certain book but not edit it(must not access the class setters).as the customer has no permission to modify book so he is the unprivileged class in the read only pattern and the librarian is the privileged class (privileged class the class that can access the setters)

Diagram

Description automatically generated

Abstraction occurrence-Books

Instead of having multiple book objects (book copies) of the same book with only different barcode. we made abstraction occurrence pattern to have all book copies bar code in a separate class and the book object will have an array list of all the book copies it has.

Diagram

Description automatically generated

Strategy pattern-Room Subscription + Payment strategy

Our system has different payment methods like PayPal and credit cards, we want the user to choose between them while subscribing. we added strategy pattern so the user will change the payment behavior based on his payment choice.

Diagram

Description automatically generated

DTO patterns -Customer + Document

We want to have an object that have the document the need to be printed along with the customer id who initiated the print requestand transfer this object to another subsystemwhich is the library printing system. note that the library management system and printing system are two different systems.

Graphical user interface, diagram

Description automatically generated with medium confidence

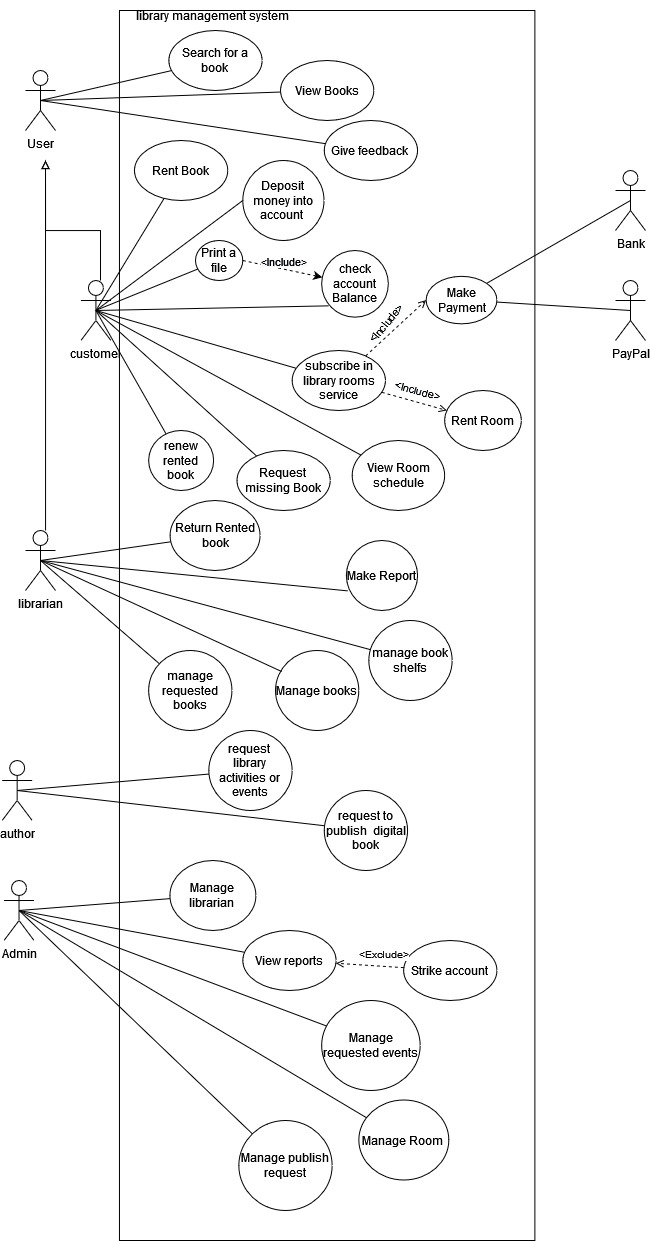
Data mapper -admin, librarian, customer

Diagram

Description automatically generatedDiagram

Description automatically generatedWe used 3 data mappers in our system as, we have admin data mapper that have the methods that will allow the admin to insert, modify and edit different types of data like {Room, Librarian, Events and Digital Books}. So, to access the data in the database the admin must use the mapper. Like so the librarian has different data mapper, as he/she have different accessibility to the database, {manage books, manage bookshelves}. Moreover, the customer has different approach as he only views the data in the database without modifying it.

Use Case Diagram



Use Case Scenarios

Hazem Mohsen:

|  |  |
| --- | --- |
| ID: | LIB\_01 |
| Title: | Search for a Book |
| Description: | This function makes the use able to search for specific book by book’s name or author name |
| Primary actor: | User |
| secondary actor: | None |
| Pre-condition: | * User logged into the system |
| Basic flow of events: | 1. When the user open the system he will press search for a book button. 2. The user will write the name of the book or the author’s name then press search. 3. The user will be able to view the book if it’s found and its location. |
| Extensions: | A.2 if the user entered wrong book name or author’s name the system will print “This book isn’t found “ |
| Post conditions: | 1. The user will be able to view information about the book 2. The user will be able to rent the book if it is found |
| Priority: | HIGH |

Hazem Mohsen:

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| --- | --- |
| ID: | LIB\_02 |
| Title: | View Books |
| Description: | This function views to the user all the list of books in the library also it is to view the information about any book in the library and the user’s rate about it. |
| Primary actor: | User |
| secondary actor: | None |
| Pre-condition: | * User logged into the system |
| Basic flow of events: | 1. When the user open the system he will view books button. 2. The user will enter the book category then enter 3. The user will be able to view all the book about this specific category and the user will be able to view description about the book and book’s rate. |
| Extensions: | A.2 if the user entered wrong book category the system will print “This book isn’t found “ |
| Post conditions: | None |
| Priority: | MEDIUM |

Hazem Mohsen:

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| --- | --- |
| ID: | LIB\_03 |
| Title: | Give feedback |
| Description: | This function is for the user to give to the admin feedback, the user will fill a form about the library system in order to send this feedback to the admin. |
| Primary actor: | User |
| secondary actor: | None |
| Pre-condition: | * User logged into the system |
| Basic flow of events: | 1. When the user open the system he will press give feedback button 2. The user will start filling the form which is what is the feedback about then start writing the feedback. |
| Extensions: | A.2 there might delay in the server or network problem so there will be delay in sending the feedback  B.2 The feedback might be lost because of server drop so the system will print ”please fill the form again” |
| Post conditions: | 1. The form will be sent to the admin 2. The form will be saved in the user feedback database |
| Priority: | LOW |

Hazem Mohsen:

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| --- | --- |
| ID: | LIB\_04 |
| Title: | Rent Book |
| Description: | This function is for the customer to rent a book from the library. |
| Primary actor: | customer |
| secondary actor: | None |
| Pre-condition: | * User logged into the system |
| Basic flow of events: | 1. The customer will press rent a book button 2. The customer will have to enter the book name 3. If the name of the book is found and available the customer will be rent the book and the customer will have to enter how much days the book will be rented. |
| Extensions: | A.2 if the user entered wrong book name or author’s name the system will print “This book isn’t found “  A.3 if the book is not available the system will print “the book isn’t available right now” |
| Post conditions: | 1. The book will be rented and saved in the customer’s database 2. If there is no other copies of the book in the library after it is rented the book will be market is an available |
| Priority: | LOW |

Hazem Mohsen:

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| --- | --- |
| ID: | Lib\_05 |
| Title: | Deposit money into account |
| Description: | This function is for the customer to transfer money into account in order to print papers or use it in renting room |
| Primary actor: | customer |
| secondary actor: | bank |
| Pre-condition: | * User logged into the system |
| Basic flow of events: | 1. Customer will press deposit money button 2. Then the customer have to put his credit card information 3. The system will ask the user for the money amount then it will check if the money available in the credit card account 4. The user will confirm the payment and money will be transfer into the account where the user can use it in things like printing papers |
| Extensions: | A.2 the system press confirm and not every required space is fill the system will print “please fill any required empty space”  A.3 if the user did not have enough money in the credit card the system will print “your bank account does not have enough money”  A.4 there might be delay because of low network speed so the money might take time until it is transferred |
| Post conditions: | 1. The customer money will be transferred from the bank account into its library system account |
| Priority: | HIGH |

Abdullah Yasser:

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| --- | --- |
| ID: | LIB\_06 |
| Title: | Print a file. |
| Description: | The customer can print different types of documents using the printer system in the library. |
| Primary Actor: | Customer |
| Supporting  Actor(s): | none |
| Preconditions: | * The printer system is available to work. * The queue of requests in the printing system is not full. * The customer has enough balance for the service. |
| Basic Flow of events: | 1. The customer provides the document object. 2. The customer will check if he has enough money for the service. 3. The library system will send the document object in addition to the customer id to the printer system. 4. The printer system will add the request to the queue of requests. 5. When the task of printing is finished the printer will deliver the printed hard copy to the user by calling his id. |
| Extensions: | 1. 3: if the requests queue is full the printer system will notify the user to wait till the queue is free. |
| Postconditions: | None |
| Priority: | Low |

Abdullah Yasser:

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| --- | --- |
| ID: | LIB\_07 |
| Title: | Check account balance. |
| Description: | The customer will be able to check his balance in account to use it for renting or paying to the printing system. |
| Primary Actor: | Customer |
| Supporting  Actor(s): | none |
| Preconditions: | * Customer registered in the system. |
| Basic Flow of events: | 1. The customer login in the system. 2. Then open the profile to view his balance. |
| Extensions: | 1. 1: not registered before so he must register. |
| Postconditions: | None |
| Priority: | Low |

Abdullah Yasser:

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| --- | --- |
| ID: | LIB\_08 |
| Title: | Subscribe in library rooms service. |
| Description: | The customer will be able to subscribe into the library rooms service categories, using the balance in the system or different payment methods. |
| Primary Actor: | Customer |
| Supporting  Actor(s): | None |
| Preconditions: | * The customer must have credit card or PayPal account. |
| Basic Flow of events: | 1. The customer will view the subscription categories with the prices. 2. The customer will the category. 3. The customer will choose the payment method he/she wants. 4. Then the make payment method will be called. |
| Extensions: | 1. 3: the customer does not have credit card or PayPal. |
| Postconditions: | * The customer will call for the make method with the category he chose and the payment method. |
| Priority: | High |

Abdullah Yasser:

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| --- | --- |
| ID: | LIB\_09 |
| Title: | Make Payment. |
| Description: | The customer will be able to call his method to be able to subscribe to the renting room service. |
| Primary Actor: | Customer |
| Supporting  Actor(s): | Bank | PayPal |
| Preconditions: | * The customer must have chosen the subscription category and the payment method. |
| Basic Flow of events: | 1. The library system will contact the bank or PayPal systems to check the balance. 2. The system specified will exclude the amount needed for the subscription. 3. A receipt will be returned to the customer. |
| Extensions: | 1. 1: the service from the payment methods may be down, so the library system will notify the customer to wait. 2. 1: the balance of the customer may not be satisfying the amount wanted for the service. |
| Postconditions: | * The customer will be subscribed to the specified category he/she paid. * He /She will be able to rent rooms. |
| Priority: | High |

Abdullah Yasser:

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| --- | --- |
| ID: | LIB\_10 |
| Title: | Rent room |
| Description: | The customer can rent a room in the library. |
| Primary Actor: | Customer |
| Supporting  Actor(s): | None |
| Preconditions: | * The customer must be logged in. * The customer must be subscribed in the room reservation serves |
| Basic Flow of events: | 1. The customer selects a room and a duration 2. The system confirms the process. |
| Extensions: | a. 1: the room is reserved, so the customer will be notified by the system that the room us reserved.    b. 1: the customer subscription has ended, so the system notifies the customer that his subscription has ended, and he cannot reserve the room. |
| Postconditions: | The room statues will change from free to reserve. |
| Priority: | Medium |

Seif Hammam:

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| --- | --- |
| ID: | LIB\_11 |
| Title: | Renew rented book |
| Description: | The customer use this function to renew the use of a rented book to use a book for longer time with the knowledge of the library system |
| Primary Actor: | customer |
| Supporting Actor(s): | none |
| Pre-conditions: | * Customer log into the system * Customer already rented the book before |
| Basic Flow of events: | 1. customer use the function to inform the library that he wants to renew the use of a book 2. customer select the new date that he should submit the book at the library 3. the request is sended to the librarian 4. the database is updated |
| Extensions: | * Another customer requesting the book at the same time  1. The system shows a message that the book is already rented by another customer |
| Post conditions: | 1. The new date for returning the book is added to the system |
| Priority: | low |

Seif Hammam:

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| --- | --- |
| ID: | LIB\_12 |
| Title: | Request missing Book |
| Description: | The customer requests a book that is missing from the library and an outside source will bring it to the library |
| Primary Actor: | Customer |
| Supporting Actor(s): | Librarian |
| Preconditions: | * The book required is missing from the system |
| Basic Flow of events: | 1. The customer write the name of the book that he needs and sends a request 2. The librarian receives the request and request the book from the outside source |
| Extensions: | * The requested book has no copies  1. System sends a message to the customer that the book isn’t found |
| Post conditions: | 1. The requested book is added to the library 2. The customer can rent it |
| Priority: | low |

Seif Hammam:

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| --- | --- |
| ID: | LIB\_13 |
| Title: | View Room schedule |
| Description: | The customer shows the available time slots for renting a room |
| Primary Actor: | customer |
| Supporting Actor(s): | none |
| Preconditions: | * None |
| Basic Flow of events: | 1. The system shows the available time slots at the library 2. The customer choose the free time slot that he wants to rent it |
| Extensions: | * None |
| Post conditions: | 1. The slot chosen will be reserved for the customer with his Id 2. The time slot chosen will be removed from the system until it become free again |
| Priority: | low |

Seif Hammam:

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| --- | --- |
| ID: | LIB\_14 |
| Title: | Return Rented book |
| Description: | The librarian adds to the system that the book which is rented by the customer returned to the library and available for renting again |
| Primary Actor: | Librarian |
| Supporting Actor(s): | none |
| Preconditions: | * The customer return the book to the library |
| Basic Flow of events: | 1. The customer gives the librarian the book which is rented 2. The librarian adds the availability of the book to the system again |
| Extensions: | * The book is damaged  1. The librarian brings another copy first of the book then adds its availability later |
| Post conditions: | 1. The book is available again for renting |
| Priority: | low |

Seif Hammam:

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| --- | --- |
| ID: | LIB\_15 |
| Title: | Make Report |
| Description: | The librarian make report of the status of the book that was rented if there is any damage happened to it |
| Primary Actor: | librarian |
| Supporting Actor(s): | none |
| Preconditions: | * The customer return the rented book * There is damage happened to the book |
| Basic Flow of events: | 1. The customer return the damaged book 2. The librarian make a report for the admin to inform him the new status for the book |
| Extensions: | * None |
| Post conditions: | * The admin requests a new copy for the book |
| Priority: | low |

Hossam Hassan:

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| --- | --- |
| ID: | LIB\_16 |
| Title: | Manage books |
| Description: | Librarian Member uses this function when he/she needs to make a change on the data about books like adding a new book to the database, changing old book information, and deleting books. |
| Priority: | High |
| Primary Actor: | Librarian |
| Secondary Actor: | N/A |
| Preconditions | * The user (Librarian) must log in to the system. |
| Post-conditions | There is a message that will appear to the user (Librarian) containing successful of the process. |
| Main Success Scenario | 1. The user (Librarian) after login into the system. A list of functions will show up, then he/she chooses/click on the “Manage Books” button. 2. The user must specify which process he/she wants to use (add, update, delete). 3. In case of (update and delete), A list of books will appear, the user must choose which book he/she wants to update/delete. 4. In case of adding, a new window is generated in which the user starts to insert the book information. 5. After that, he/she must click on the “Save process” button. |
| Extensions | 5a. If the user clicks on the “Save process” button without completing the book information the system will generate a message containing that “Please insert all book information, the process denied”. (Error)  5b. If the user clicks on the “Save process” button and inserts info in the wrong place (ex: inserting integers in the author name which meant be a string) the system will generate a message containing that “Please use right syntax, the process denied”. (Error) |

Hossam Hassan:

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| --- | --- |
| ID: | LIB\_17 |
| Title: | Manage Requested Books |
| Description: | Librarian Member uses this function when he/she needs to add new requested book (a book customer wants) to the system, delete requested book from the database (requested cancelled). |
| Priority: | Moderated |
| Primary Actor: | Librarian |
| Secondary Actor: | N/A |
| Preconditions: | * The user (Librarian) must log in to the system. * The system must check if the request was located at the data or not. |
| Post-conditions: | * There is a response message that will appear to the user (Librarian) containing the successful of the process. * requested book will be added to the system |
| Main Success Scenario: | 1. The user (Librarian) after login into the system. A list of functions will show up, then he/she chooses/click on the “Manage Requested Books” button. 2. The user must specify which process he/she wants to use (add or delete). 3. A list of requested books will appear, the user must choose which book he/she wants to approch. 4. After that, he/she must click on the “Save process” button. |
| Extensions: | 4a. If the user clicks on the “Save process” button without completing the book information the system will generate a message containing that “Please insert all book information, the process denied”. (Error)  4b. If the user clicks on the “Save process” button and inserts info in the wrong place. The user entered a wrong ID, so a pop-up message should appear to confirm if this is the right ID he wants to edit. |

Hossam Hassan:

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| --- | --- |
| ID: | LIB\_18 |
| Title: | Request library activities or events |
| Description: | Customer Member uses this function when he/she needs to reserve a ticket for an activity/event by sending a request to the librarian to get confirmation of joining the event. |
| Priority: | Moderated |
| Primary Actor: | Customer |
| Secondary Actor: | N/A |
| Preconditions: | * The user (Customer) must log in to the system. * The system check if the customer is already registered or not. * The system must check if the event capacity was full or not. |
| Post-conditions: | There is a response message that will appear to the user (requester) containing the Librarian's answer for his request. |
| Main Success Scenario: | 1. The user (Customer) after login into the system. A list of functions will show up, then he/she chooses/click on the “Request library activities or events” button. 2. A list of events will appear, the user must choose which events he/she wants to reserve. 3. After that, he/she must click on the “Send Request” button. |
| Extensions: | 2a. If the user chooses a full event (there is no place for a new person) the system will generate a message containing that “The event you have chosen is full, the process denied”. (Error) |

Hossam Hassan:

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| --- | --- |
| ID: | LIB\_19 |
| Title: | Request to publish digital book |
| Description: | Admin member uses this function when he/she needs to add a digital book to the database after getting request from the book author. |
| Priority: | Moderated |
| Primary Actor: | Admin |
| Secondary Actor: | N/A |
| Preconditions: | * The user (Admin) must log in to the system. * The system must check that the book was not in database. |
| Post-conditions: | - Book information will be added in the system.  - Success message will display. |
| Main Success Scenario: | 1. The user (Admin) after login into the system. A list of functions will show up, then he/she chooses/click on the “Request to publish digital book” button. 2. The user (Admin) must insert the book information. 3. After that, he/she must click on the “Save process” button. |
| Extensions: | 3a. If the user clicks on the “Save process” button without completing the book information the system will generate a message containing that “Please insert all book information, the process denied”. (Error)  3b. If the user clicks on the “Save process” button and inserts info in the wrong place (ex: inserting integers in the author name which meant be a string) the system will generate a message containing that “Please use right syntax, the process denied”. (Error) |

Hossam Hassan:

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| --- | --- |
| ID | LIB\_20 |
| Title | Manage Librarian |
| Description | Admin Member uses this function when he/she needs to make a change on the data about Librarians like adding a new Librarian to the database, changing old Librarian information, and removing Librarian. |
| Priority | High |
| Primary Actor | Admin |
| Secondary Actor | N/A |
| Preconditions | * The user (Admin) must log in to the system. * In cases of update and delete the Librarian must be in the system data. * In case of adding the Librarian must not be in the system data. |
| Post-conditions | * There is a message that will appear to the user (Admin) containing successful of the process. * In case of adding the data must be added to the database. * In cases of update and delete the Librarian info must be changed or removed from the database. |
| Main Success Scenario | 1. The user (Admin) after login into the system. A list of functions will show up, then he/she chooses/click on the “Manage Librarian” button. 2. The user must specify which process he/she wants to use (add, update, delete). 3. In case of (update and delete), A list of Librarians will appear, the user must choose which Librarian he/she wants to update/delete. 4. In case of adding, a new window is generated in which the user starts to insert the Librarian information. 5. After that, he/she must click on the “Save process” button. |
| Extensions | 5a. If the user clicks on the “Save process” button without completing the Librarian information the system will generate a message containing that “Please insert all Librarian information, the process denied”. (Error)  5b. If the user clicks on the “Save process” button and inserts info in the wrong place (ex: inserting integers in the Librarian name which meant be a string) the system will generate a message containing that “Please use right syntax, the process denied”. (Error) |

Ahmed Salah:

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| --- | --- |
| ID: | LIB\_21 |
| Title: | View reports |
| Description: | The admin can view the report details that the librarian filed against a customer |
| Primary Actor: | Admin |
| Supporting  Actor(s): | none |
| Preconditions: | * The admin must be logged in to the system. |
| Basic Flow of events: | 1-admin press on **View Reports** button .  2-a list of all reports is displayed to the admin.  3-the admin can press on any report from the list to view it  4-the chosen report details is displayed to the admin which is librarian id ,customer id title and the content of the report |
| Extensions: | 1.a.there are no reports in the reports list.  1. the admin will be notified by the system that there are no reports  2. the system will return to the main page |
| Postconditions: | none |
| Priority: | medium |

Ahmed Salah:

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| --- | --- |
| ID: | LIB\_22 |
| Title: | Strike user |
| Description: | The admin could strike user account if it got reported by a librarian. The admin can choose whether to strike the account or not based on the report reason . |
| Primary Actor: | Admin |
| Supporting  Actor(s): | none |
| Preconditions: | * The admin must be logged in to the system. * The admin must select a report from the reports list |
| Basic Flow of events: | 1-the admin view the report content.  2-the admin press the strike button to strike the user .  3-the strike counter on the user account will be incremented |
| Extensions: | 1.a.there are no reports in the reports list.  1. the admin will be notified by the system that there are no reports  2. the system will return to the main page |
| Postconditions: | The user account will be updated with the new strike. If a user account has more than three strikes. The user account will be suspended automatically |
| Priority: | medium |

Ahmed Salah:

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| --- | --- |
| ID: | LIB\_23 |
| Title: | Rent room |
| Description: | The customer can rent a room in the library |
| Primary Actor: | customer |
| Supporting  Actor(s): | none |
| Preconditions: | * The customer must be logged in. * The customer must be subscribed in the room reservation serves |
| Basic Flow of events: | 1-the customer select a room and a duration  2-the system confirms the process . |
| Extensions: | 1.a. the room is reserved.  1. the customer will be notified by the system that the room us reserved  2. the system will return to the main page    1.a.the customer subscription has ended .  1. the system notifies the customer that his subscription has ended, and he can not reserve the room  2. the system will return to the main page |
| Postconditions: | The room statues will change from free to reserved |
| Priority: | medium |

Ahmed Salah:

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| --- | --- |
| ID: | LIB\_24 |
| Title: | Manage requested events |
| Description: | The admin can accept or decline an event request |
| Primary Actor: | Admin |
| Supporting  Actor(s): | none |
| Preconditions: | * The admin must be logged in to the system. * Must chose an event from the requested event list |
| Basic Flow of events: | 1-the admin press on accept  2-the system will save the event data to the database and confirm the process |
| Extensions: | 1.a.the requested events data has passed.  1. the admin will be notified by the system that the event date has passed  2. the system will return to the main page and delete the request |
| Postconditions: | The new data the admin typed will be saved by the system |
| Priority: | high |

Ahmed Salah:

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| --- | --- |
| ID: | LIB\_25 |
| Title: | Manage Room |
| Description: | The admin can add delete or modify Room on the system |
| Primary Actor: | Admin |
| Supporting  Actor(s): | none |
| Preconditions: | * The admin must be logged in to the system. |
| Basic Flow of events: | 1-admin input the Room id  2-admin chose wither to add or delete or modify  3- type the new data he wants the system to save  4- the system saves the data and confirm |
| Extensions: | 1.a.there are no Rooms with the id the admin typed.  1. the admin will be notified by the system that there the no Rooms id is mismatched  2. the system will return to the main page |
| Postconditions: | The new data the admin typed will be saved by the system and update the old data |
| Priority: | high |

Ahmed Salah:

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| --- | --- |
| ID: | LIB\_26 |
| Title: | Manage Publish request |
| Description: | The admin can accept or decline aa publish request made by the author(the author requests to publish a digital book ) |
| Primary Actor: | Admin |
| Supporting  Actor(s): | none |
| Preconditions: | * The admin must be logged in to the system. * Must chose a publication request from the requested digital books list |
| Basic Flow of events: | 1-the admin press on accept  2-the system will save the digital book data to the database and confirm the process |
| Extensions: | none |
| Postconditions: | The new data the admin typed will be saved by the system |
| Priority: | high |

Non-Functional Requirements Scenarios

Hazem Mohsen:

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| --- | --- |
| Quality Attribute: | Design and interoperability |
| Source: | Customer |
| Stimulus: | The customer wants to access the database to modify books details. |
| Artifact: | Database, Bank System. |
| Environment: | Normal operational mode. |
| Response: | The money will be transferred into the customer’s account and the customer will be notified or if any problem happened in the transaction the customer will be notified. |
| Response Measure: | All the money amount have to be transferred successfully. |

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| Quality Attribute: | Modifiability |
| Source: | Admin |
| Stimulus: | Admins wants to modify one of the librarian’s data in the system database. |
| Artifact: | Database. |
| Environment: | Normal operational mode. |
| Response: | The new librarian data will be added to the database. |
| Response Measure: | All the data of the new librarian will be added to the data base without any errors successfully |

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| --- | --- |
| Quality Attribute: | Design and performance |
| Source: | User |
| Stimulus: | Customer wants to search for a book. |
| Artifact: | Database. |
| Environment: | Normal operational mode. |
| Response: | The system will view this specific book or if the book name was not found in the data base the user will be notified. |
| Response Measure: | an average latency of 10 seconds. |

Abdullah Yasser:

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| Quality Attribute: | Maintainability |
| Source: | Customer |
| Stimulus: | Make feedback about the experience and rating the service. |
| Artifact: | Service of the system. |
| Environment: | Normal operational mode. |
| Response: | The system will notify the librarian about the customers feedbacks, then he/she learns from the user experience how to maintain the system. |
| Response Measure: | As the customer make the feedback, it will be sent to the librarian in less than 60 sec. |

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| Quality Attribute: | Usability |
| Source: | Customer |
| Stimulus: | The customer has rented a room in a wrong day accidentally, so, he can modify the date easily. |
| Artifact: | Database. |
| Environment: | Run time |
| Response: | The rented room with the details of it will be saved in the customer’s profile, in addition to a notification will be popped out to the customer’s GUI. So, if wrong details are saved the customer can modify it in the database. |
| Response Measure: | As the customer rent a room it will be saved immediately to the database, then he/she can modify it and the new details will be override the saved data in the database. |

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| --- | --- |
| Quality Attribute: | Security |
| Source: | Customer |
| Stimulus: | The customer wants to access the database to modify books details. |
| Artifact: | Database. |
| Environment: | Run time |
| Response: | The system will block him from entering the database as he/she has only the gate to view only books. |
| Response Measure: | No changes to the database, and the admin will be notified immediately if a customer tries to alter something in database. |

Seif Hammam:

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| --- | --- |
| Quality Attribute: | Design and interoperability. |
| Source: | Customer. |
| Stimulus: | A payment request for booking a room. |
| Artifact: | Process, Banking System, Database. |
| Environment: | Normal operational mode, Peak load. |
| Response: | 1. The request is accepted, and the transaction is done successfully 2. The request is rejected, and the customer is notified and the system also |
| Response Measure: | 95% of information exchanges correctly processed |

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| Quality Attribute: | Design and reusability. |
| Source: | Customer and users |
| Stimulus: | Use system efficiently and minimize impact of errors. |
| Artifact: | library management system. |
| Environment: | runtime |
| Response: | 1. System will provide knowledge of the working criteria to prevent mistakes. 2. User will feel familiar and comfortable with the system. |
| Response Measure: | 1. Performing an operation takes no time with no mistakes |

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| --- | --- |
| Quality Attribute: | Design and performance |
| Source: | Customer |
| Stimulus: | A customer is renting a book. |
| Artifact: | Library Management System, Database. |
| Environment: | Normal operational mode. |
| Response: | Changing the state of the book from availability to “rented”. |
| Response Measure: | A maximum latency of 5 seconds. |

Ahmed Salah:

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| --- | --- |
| Source: | Librarian (End-User) |
| Stimulus: | Access customer payment info |
| Artifact: | The system data |
| Environment: | Run time |
| Response: | The system will block the librarian access request because he is not authorized to view protected data |
| Response Measure: | The system blocks the access 100% of the librarian trails |

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| --- | --- |
| Source: | Customer |
| Stimulus: | Initiate rent room request |
| Artifact: | The library management system |
| Environment: | Normal operational mode |
| Response: | The request is processed by the system |
| Response Measure: | The delay average is 4 seconds (latency) |

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| --- | --- |
| Source: | Librarian (End-User) |
| Stimulus: | Modify bookshelf information |
| Artifact: | Database |
| Environment: | Run time |
| Response: | Apply the modification, test the modified data based on constraints, deploy the modified shelf |
| Response Measure: | * The system adds the data in 90 minutes * No defects are done to the database |

Hossam Hassan:

Diagram

Description automatically generated

Graphical user interface, application

Description automatically generatedPackage Diagram

Diagram, schematic

Description automatically generatedClass Diagram

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| Test Case ID | Test\_ADD\_Room |
| Description | The admin adds a room to the system using a function that communicates with the data mapper that is responsible for database handling |
| Preconditions | N/A |
| Postconditions | The room is added into the database |
| Main Path | 1-input room data like room id and floor  2-confirms |
| Alternative Path | AdminMpper.AddRoom()🡪database |

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| Test Case ID | View\_Reports |
| Description | The admin View all the reports done by librarian using a function that communicates with the data mapper that is responsible for database handling |
| Preconditions | At least one report must exist in the database |
| Postconditions | The function returns all the reports as a string |
| Main Path | 1-click on show Reports  2- press confirm button  Admin>admin.ViewReports() 🡪AdminMpper.ViewReports ()🡪database |
| Alternative Path | NA |

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| Test Case ID | ModifyRoom\_ |
| Description | The admin Modifies a specific room in the database using a function that communicates with the data mapper that is responsible for database handling |
| Preconditions | The chosen room must exist in the data base |
| Postconditions | The room data is updated |
| Main Path | 1-chose room by inputting room id  2-chosing the filed that need the update  3-enter the new data  4-confirms |
| Alternative Path | 1-delete the room  2-creating a new room with updated values |

